Petrological Abstracts and Reviews

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Adams, Sidney F. "A Microscopic Study of Vein Quartz," *Econ. Geol.*, XV (1920), 623–64. 48 figs. on 8 pls.

This study of the microscopic characteristics of vein quartz is confined to quartz of hydrothermal origin; magmatic, metamorphic, and replacement quartz are not included. A well illustrated and instructive paper.

Allen, E. T., and Lombard, Robert H. "A Method for the Determination of Dissociation Pressures of Sulphides, and Its Application to Covellite and Pyrite," *Amer. Jour. Sci.*, XLIII (1917), 175–95.

A secondary enrichment investigation of the Geophysical Laboratory, in which methods and apparatus are described.

Andersen, Olaf. "On Aventurine Feldspar," *Amer. Jour. Sci.*, XL (1915), 351–99. Figs. 13, pls. 3.

The schiller in certain feldspars was determined as being due to oriented, lamellar inclusions of hematite of various shapes and sizes. They originated through the unmixing of an originally homogeneous feldspar which contained iron oxides in solid solution. The lamellae were found always to be oriented after simple crystal forms.

Backlund, Helge. "Petrogenetische Studien an Taimyrgesteinen," *Geol. Fören. i Stockh. Förhandl.*, XL (1918), 101–203. Figs. 11, map 1.

This is a petrological study based upon about 500 specimens collected by the unfortunate Baron v. Toll in his expedition to Taimyr Peninsula, in northern Asia. The region is made up of gneisses, mica, and other schists, contact hornfeld-like rocks, and three types of granite. Many of the rocks were analyzed, and they are computed into norms and into the Osann system, while under granite the percentage modes

also are given. Besides detailed descriptions of the various rocks, there is a good discussion of movement in solidified rock, illustrated by numerous diagrams.

BARRELL, JOSEPH. "Relations of Subjacent Igneous Invasion to Regional Metamorphism," *Amer. Jour. Sci.*, I (1921), 1–19, 174–86, 255–67.

This paper, written by the late Professor Barrell in 1913 or 1914, has been edited and seen through the press by Frank F. Grout, and no better abstract of it can be given than Mr. Grout's own summary.

Evidence is presented that batholithic invasions widen downward and may occur close below many rocks where they have not been suspected. Batholiths like those in the American Cordillera seem to come to place without crustal compression, but those of the Archean shield and those of the later Appalachian invasions are accompanied by compression. A detailed study of three or four regions shows the metamorphism to be related to the igneous invasion more than to the depth and pressure. One of the regions of deepest burial and close folding in Pennsylvania shows slight metamorphism.

The action of magmas, both by heating and metasomatism, is reviewed. The solutions are not meteoric in origin. The results in minerals depend on equilibria—largely on the presence of H_2O and CO_2. The depth of anamorphism may be small, due (1) to weakness of some rocks, (2) to invasion of batholiths. An argument for shallow depth is based on the completeness of Archean metamorphism and the salt of the ocean as a measure of erosian.

The features of metamorphic rocks are reviewed and interpreted as due to one or another factor. Major factors are batholithic invasion and compression. Movements of solutions, selective crystallization, lit-par-lit injection gneisses, and the alternation of injection and mashing, each leaves its marks.

BARTRUM, J. A. "The Conglomerate at Albany, Lucas Creek, Waitemata Harbour," *Trans. New Zealand Institute*, LII (1920), 422–30. Pls. 2.

The conglomerates of the Albany Riverhead district (probably of Upper Miocene age) contain pebbles of greywacke, argillite, granodiorite, quartz-diorite, diorite-gneiss, diorite, anorthosite, dolerite, andesite, trachyte, and rhyolite. In this paper the igneous rocks are briefly described and four photomicrographs are given. It is suggested that the gneissic rocks in conglomerates, here and elsewhere in the North Island, perhaps furnish evidence of a terrain injected by batholitic intrusions, subjected to compressional stresses, and eroded before the deposition of the main mid-Mesozoic sedimentaries.

BARTRUM, J. A. "Additional Facts Concerning the Distribution of Igneous Rocks in New Zealand," *Trans. New Zealand Institute*, XLIX (1916), 418–24. Figs. 3.

Brief descriptions are given of hypersthene-basalt, troctolite, granodiorite with epidote (which the writer, not the reviewer, thinks primary), basalt with biotite (character of the feldspar of the rock not given), hornblende-basalt, andesite, diorite, and trachyte. Most of the descriptions are too brief and incomplete to permit passing judgment on the names.

BARTRUM J. A., "Additional Facts Concerning the Distribution of Igneous Rocks in New Zealand: No. 2," *Trans. New Zealand Institute*, LII (1920), 416–22. Figs. 5.

Here are brief descriptions of norite, dolerite, basalt, and hypersthene-andesite, and one more extended of quartz-norite. The dolerite is apparently the diabase of United States usage. The quartz-norite is described as "a moderately typical norite but for two considerations: first the plagioclase . . . . is somewhat acid, being in the main andesine-labradorite; secondly, there is . . . . a little interstitial quartz." A third objection which might have been given is the fact that besides hypersthene there is abundant augite, biotite, some hornblende, and "probably a third pyroxene." With a feldspar more acid than $Ab_{50}An_{50}$ why not call the rock quartz-hypersthene-diorite? The "third pyroxene" is described in considerable detail. All but one of its properties, including orientation, agree with hypersthene, the exception being the "extinction angle which was found to be from very small to 42°." *May* this mineral not be hypersthene? The reviewer has found that this mineral, in many cases, gives apparently inclined extinction in sections which are cut at right angles to the principal sections and yet show only one set of prismatic cleavage lines brought out by the grinding. Measuring then from the cleavage lines, the extinction is inclined, but it will usually be seen, if the stage is turned an equal number of degrees beyond the point of extinction, that there are here traces of the other cleavage. Random sections cutting all three axes in orthorhombic crystals do, of course, show inclined extinctions when measured from cleavage lines. Zoisite is mentioned as a mineral originally identified as apatite, and surprise is expressed that apatite does not occur although the analysis gives considerable P_2O_5. The sketch given of this

mineral may well represent a corroded apatite of a form not uncommon, and its occurrence surrounded by magnetite is indicative of the same mineral. Unless the fragments were large enough to permit of absolute determination as zoisite, the reviewer is inclined to think the original identification correct.

BECKE, F. *Ueber den Monzonit.* Festschrift C. Doelter. Dresden and Leipzig, 1920, 1–14. Fig. 1.

Monzonite, originally a collective name for all the different rocks found on Predazzo and Monzoni, has been variously used. Becke gives the following definition: Monzonite is a plutonic rock of granular texture. Its essential constituents, in the order of their crystallization, are magnetite, augite, hornblende, biotite, plagioclase (average composition andesine), and perthitic orthoclase. Small amounts of quartz or aegirite-augite or nephelite may occur. Accessory minerals are apatite and titanite. The dark and light constitutents, also the orthoclase and plagioclase, are of approximately equal amounts. Chemically the An: Ab: Or ratios are about 20:45:35; and the Ca:Mg:Fe=30:30:40. SiO_2 fluctuates around the point of saturation, so that quartz or a feldspathoid may occur in small amounts. Becke objects to the use of the term monzonite as applied to rocks of the "Pacific type." The silica content must be below 63–64 per cent. The term thus used is dependent upon the chemical composition. Used in the foregoing sense, many rocks described as quartz-monzonites are not such at all.

BENSON, W. N. "Report on the Petrology of the Dolerites Collected by the British Antarctic Expedition, 1907–1909," *Geology*, Vol. II, of Shackleton's Report. London, n.d., 153–60. Figs. 6.

Dolerites, in this report, are rocks composed essentially of basic plagioclase and pyroxene, with varying amounts of quartz. Following British usage they are called dolerites (diabases, United States). Since the name was originally given by Hauy to coarse-grained basalts, the use of the expression aphanitic dolerite seems anomalous. Several analyses, recast in the C.I.P.W. system, are given, and the rocks and component minerals are described in detail.

BENSON, W. N. "The Origin of Serpentine, a Historical and Comparative Study," *Amer. Jour. Sci.*, XLVI (1918), 693–731.

The author agrees with the general opinion that chrysotile- or antigorite-serpentine of large ultrabasic masses is derived from the alteration of originally intrusive peridotite; the hydration, in some cases at least, having been brought about by the agency of waters emanating from the same magma as that which produced the peridotite. Whether a peridotite which escaped hydration during the igneous epoch can subsequently be changed to serpentine by the action of deep circulating epigene waters is regarded as less clear though thought not improbable. The reviewer is glad to see followed here his own mode of indicating by asterisks, in the bibliography, works not seen by the writer.

BENSON, W. N. "The Geology and Petrology of the Great Serpentine Belt of New South Wales," Parts VI (Appendix) and VII. *Proc. Linnean Soc. New South Wales*, XLII (1918), 693–700, XLIII (1918), 320–94. Map 1, pls. 10, figs. 5.

The preceding papers of this series were reviewed in *Jour. Geol.*, XXV (1917), 493–95. In the present papers the rocks of the Attunga and Loomberah districts, and of a portion of the Goonoo Goonoo Estate are described. Two analyses of dolerites are given and keratophyres, dolerites, albite-dolerites, and granophyres are described rather completely, although much-to-be-desired model percentages are not given.

BEREK, M. and JENTZSCH, F. "Ein kleiner lichtstarker Monochromator, besonders für mikroskopische Beobachtungen," *Zeitschr. f. Instrumentenkunde*, 1914, 47–51. Figs. 2.

Describes a small monochromator for the production of monochromatic light. The instrument is only half as large as a petrographic microscope, and is so arranged that the whole spectrum may be made to pass through the opening without adjusting the light source or the microscope. The visible portion of the spectrum is normally 12 mm. but the emergence slit may be adjusted to any width. The emerging ray may be made parallel, convergent, or divergent by means of a lens in a sliding tube.